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On the Mortality arising from Military Operations. By WILLIAM BARWICK HODGE, Fellow of the Statistical Society of London, and of the Institute of Actuaries.

(Concluded from p. 217.)

THE facts relating to the siege of Sebastopol would seem to show that the enormously increased powers with which instruments of destruction have been endowed by the improvements of modern science tend much more to the advantage of the besiegers than of the besieged, as might indeed have been expected. We have no means of ascertaining the losses of the Russians during the siege, but from their own statements these must have been immense. The official returns of their casualties in the two assaults of the 18th June and the 8th September have been published, and are given below. The additional losses, from the 17th August to the 8th September, are estimated from Prince Gortschakoff's report of the capture; the proportion of the missing, already mentioned, being added to the killed and wounded.

	Total Killed and Wounded.
August 17th	1,500
," 18th to August 22nd	1,000
," 23rd to September 25th	4,500
September 6th to September 8th	3,968
Estimate for Artillerymen, not included in the foregoing	300
September 8th	10,808
	<hr/>
	22,076
June 17th and 18th	5,776
Total	27,852

By reference to Table IX., it will be seen that the English casualties during the whole siege, exclusive of the battles fought, were 8,961, which a similar addition for the missing would increase to 9,100.

There are no means of forming an estimate of the French loss, but to take it at double our own would certainly be a liberal allowance. This would make, during the 338 days which the siege lasted, a total loss to the assailants of 27,300, a number less than the casualties of the garrison during 25 days only—those days, however, being the most sanguinary of any that occurred.

The French garrison of Badajoz, consisting of 4,870 men, inflicted, at the siege of 1812, 4,824 casualties in 20 days upon their assailants, with a loss to themselves of 1,600 only, including deaths

from sickness. In the same year the garrison of Burgos, 2,000 in number, repulsed their opponents with a loss of 2,064 in killed and wounded during 32 days' siege, their own casualties being 639. The garrison of St. Sebastian, in 1813, was 3,200 strong; and its losses, including deaths from sickness, amounted in 21 days to 1,700, whilst those of the besiegers, in killed and wounded only, were 4,420.

The following general summary of the results of Tables III. and IV. shows the

Average Mortality and Casualties caused by Battles and Sieges.

	BATTLES.		SIEGES.		
	British only.	British and Allies.	Places taken by		All Classes.
			Capitu- lation.	Assault	
Number of each class	19	15	4	5	5 15
Ratio to a strength of 1,000	33	{ not ascer- tained }	18	59	59 42
Casualties { Mean.... Highest .. Lowest ..	114 395 22	98 176 23	50 108 26	176 313 30	169 272 74 131 313 26

Having now touched upon all the leading points of this most important investigation, I have to beg the indulgence of the Society for the many material defects in the information which I have laid before them. Some of those defects would no doubt have been avoided, had the subject fallen into abler hands; but that not a few of them were inevitable will, I think, be admitted on a consideration of the difficulties I have enumerated.

Before concluding this imperfect communication, I cannot refrain from expressing, even at the risk of being considered presumptuous, the increased admiration which, in the course of the inquiry, has been excited in my mind for the gallant army that has recently prevailed against so many misfortunes in the East. However earnestly we may deprecate the evils of war, however sternly we may refuse to be dazzled by the brightness of military glory, it is impossible to read without enthusiasm of the unflinching courage, the unrepining endurance, and the generous devotion, of those brave and noble-minded men.

The character of the English soldier at two different periods of our history has been drawn by two living historians, each well

qualified to appreciate and to describe his actions. Mr. Macaulay, after dwelling on the fervent piety, the strict morality, and the rigid discipline, of the Puritan warriors of the Commonwealth, celebrates their stubborn English courage, and the disdainful confidence with which they marched against the most renowned battalions in Europe. Sir William Napier thus compares his brethren in arms with their opponents in the Peninsula :—"Napoleon's troops fought in bright fields, where every helmet caught some beams of glory ; but the British soldier conquered under the cold shade of aristocracy—no honours awaited his daring, no despatch gave his name to the applauses of his countrymen ; his life of danger was uncheered by hope, his death unnoticed. Did his heart sink therefore ? Did he not endure with surprising fortitude the sorest of ills, sustain the most terrible assaults in battle unmoved, and, with incredible energy, overthrow every opponent ? at all times proving that, while no physical military qualification was wanting, the fount of honour was also full and fresh within him."

Eloquent as these eulogiums undoubtedly are, they are not more than equal to the deeds by which they were inspired; but those deeds, it should be remembered, were performed by men whose fortune it was to be trained to victory by either one of two out of the three greatest military chieftains whose names our modern annals record.

Amid the failures that have dimmed the lustre of our national fame, it is still a source of pride and consolation to feel that the praises awarded by history to the veterans of Cromwell and of Wellington may be applied, not only without exaggeration, but with the strictest justice, to those young and inexperienced soldiers who lately went forth in defence of the honour and safety of their country, to face for the first time the horrors of the field of battle.

If England shall continue to produce such men, it is not presumptuous to hope that, so far as human means can avail, her glory and her prosperity may be continued to distant generations.

On Mortality from Military Operations.

[APRIL]

TABLE I.—*Abstract from the Returns of the Adjutant-General, showing the Increase and Diminution of the Cavalry and Infantry of the British Army (including Foreign and Colonial Corps), from 1793 to 1815.*

N.N.B.—Numbers marked (*) are from defective Returns, and cannot be relied upon.

YEARS.	MEAN STRENGTH IN NON-COMMISSIONED OFFICERS AND RANK AND FILE.						Recruits, including Men transferred from one Corps to another.
	Serving at Home.	Serving Abroad.	Total.	Deaths.	Discharged, including Transfers to different Corps.	Desertions.	
1793.....			69,500	2,059	2,234		4,293
1794.....			106,100	8,596	4,229		12,825
1795.....			126,700	11,787	26,005		3,875
1796.....			116,300	9,858	14,634		24,492
1797.....			111,200	5,967	7,981		13,948
1798.....			116,800	4,008	7,772		11,780
1799.....			137,300	5,071	8,334		13,805
1800.....			158,900	*1,542	*4,521		*5,863
1801.....			66,300	8,117	9,229		20,600
			163,600				
Totals .....	..	..	..	57,146	85,139	3,196	14,5481
Annual Average.....	..	..	122,900	6,950	10,102	..	17,052
Annual Ratio to 1,000 }	..	..	..	..	..	..	28,313
Mean Strength.....	..	..	..	..	..	..	230
1802.....	67,400	70,300	137,700	4,417	27,139	3,383	34,939
1803.....	76,800	48,800	125,600	5,208	6,458	4,404	16,070
1804.....	97,800	48,700	146,500	6,119	4,598	5,468	16,185
1805.....	103,800	67,700	171,500	6,833	4,329	7,081	16,243
1806.....	102,600	86,200	188,800	6,495	4,688	5,748	16,931

TABLE II.—*Showing the Effective Strength and Casualties in Action of the Regular Army, including Cavalry, Infantry, and Artillery (but exclusive of Militia), in the Years 1793 to 1801, and 1803 to 1815. (Actual Period of Hostilities, 20 $\frac{4}{5}$ Years.)*

YEAR.	COMMISSIONED OFFICERS.			NON-COMMISSIONED OFFICERS AND RANK AND FILE.				Total Casualties, all Ranks.	
	Estimated Average Effective Strength.	Killed.	Wounded.	Total Casualties.	Average Effective Strength, deduced from the Returns of the Adjutant- General.	Killed.	Wounded.	Total Casualties.	
1793	3,576	14	41	55	74,500	167	609	776	831
1794	5,425	29	100	129	113,100	526	1,547	2,073	2,202
1795	6,467	8	34	42	134,700	104	533	637	679
1796	5,966	8	67	75	124,300	217	709	926	1,001
1797	5,722	3	8	11	119,200	35	92	127	138
1798	6,014	3	4	7	125,300	31	62	93	100
1799	7,085	31	208	239	147,600	558	2,822	3,380	3,619
1800	8,141	..	5	5	169,600	16	63	79	84
1801	8,395	22	170	192	174,900	507	2,782	3,289	3,481
1802	Peace	..	..	..	..	..	..	..	..
1803	6,620	25	47	72	137,900	322	973	1,295	1,367
1804	7,781	1	16	17	162,100	63	194	257	274
1805	9,101	9	47	56	189,600	157	855	1,012	1,068
1806	10,037	4	31	35	209,100	141	564	705	740
1807	10,722	32	125	157	223,800	671	1,576	2,247	2,404
1808	11,846	9	59	68	246,800	239	918	1,157	1,225
1809	12,235	63	302	365	254,900	1,317	5,185	6,502	6,867
1810	12,158	19	108	127	253,000	273	1,197	1,470	1,597
1811	12,043	80	434	514	258,400	1,548	6,382	7,930	8,444
1812	12,864	131	640	771	268,000	1,867	8,149	10,016	10,787
1813	13,248	168	955	1,123	276,000	2,804	13,958	16,762	17,885
1814	13,241	90	604	694	275,700	1,488	7,218	8,706	9,400
1815	11,040	171	680	851	230,000	2,341	9,005	11,346	12,197
Total ..	..	920	4,685	5,605	..	15,392	65,393	80,785	86,390
Average	9,078	..	..	..	189,200	..	..	..	..

TABLE III.—*Land Battles.*

Date.	Battles.	Nature of.	Battue.				British and Allies.				
			Total Strength in Officers and Men Engaged.	Killed.	Wounded.	Casualties.	Total.	Estimated Deaths.	Total Strength in Officers and Men Engaged.	Total Killed and Wounded.	
1801—March 21	Alexandria	Defensive.	14,000	243	1,193	1,436	393	28·1	..	..
1806—July 4	Maida	Offensive.	5,675	45	282	327	87	15·3	..	..
1808—Aug. 21	Vimiero	Defensive.	19,200	135	534	669	35	21·5	..	..
1809—Jan. 16	Corunna	Defensive.	16,700	158	634	792	47	25·7	..	..
July 28	Talavera	Do.	22,100	801	3,913	4,714	213	1,455	65·8	62,688	
1810—Sept. 27	Busaco	Do.	27,800	106	500	606	22	183	6·6	57,000	
1811—March 5	Barrosa	Offensive.	5,230	202	1,040	1,242	237	360	68·8	1,300	
" May 5	Fuentes d'Onore	Defensive.	22,900	170	1,043	1,213	53	37·9	16·6	1,610	
" 16	Albuera	Do.	9,000	882	2,672	3,554	395	1,328	151·0	1,439	
1812—July 22	Salamanca	Do.	30,500	388	2,714	3,102	102	770	25·2	6,500	
1813—June 21	Vitoria	Offensive.	42,000	501	2,807	3,308	79	890	21·2	4,964	
{ July 25 to Aug. 2	Pyrenees	Defensive.	30,000	559	3,693	4,252	142	1,197	39·9	4,829	
Nov. 10	Nivelle	Offensive.	47,600	277	1,777	2,054	43	675	14·2	50	
1814—Feb. 27	Orthes	Do.	27,000	210	1,411	1,621	60	404	15·0	4,644	
April 10	Toulouse	Do.	26,800	312	1,795	2,107	79	582	21·7	54,400	
1815—Jan. 8	*New Orleans	Do.	6,000	386	1,516	1,902	317	625	10·42	..	
" June 16	Ligny	Defensive	Quatre Bras	Do.	49,900	2,126	10,266	206	3,245	65·0	230,600
" " 18	Waterloo	Do.	Wavre	Do.	26,800	353	1,619	74	55·9	20·9	36,590
" Nov. 5	Alma	Offensive.	Inkermann	Defensive.	9,060	632	1,878	2,510	279	98·1	83,077
1854—Sept. 20	Estimated deaths among the wounded.	..	..	..	..	..	..	..	..	..
" Estimated casualties among the missing . . . . .	..	..	..	..	..	..	..	..	..	..
Aggregate numbers	438,205	14,517	..	49,821	114	14,517	33·0	883,900	86,884	98	

* Unsuccessful Actions.

§ Numbers not ascertained.

TABLE IV.—*Sieges.*

Undertaken by	Place.	Commenced upon	Result.	BESIEGERS.				GARRISON.			
				Casualties.				Force.	Total.	Casualties.	Per 1,000 Engaged.
				Killed.	Wounded.	Total.	Per 1,000 Engaged.				
British	Louisbourg	15 July, 1758	11	Capitulation	13,100	165	354	519	40	217	170
" "	Havana	12 June, 1762	60	Capitulation	13,800	296	650	946	69	392	284
" "	Monte Video	28 Jan., 1807	5	Taken by assault	4,000	142	421	563	141	203	508
" "	Buenos Ayres	5 July, "	2	Assault repulsed	7,800	316	674	990	127	416	533
British & Allies	Flushing	3 Aug., 1809	12	Capitulation	17,000	71	373	444	26	121	71
British & Allies	Badajoz (1st)	16 May, 1811	11	Assault repulsed	16,700	218	1,017	1,235	74	359	5,800
" "	Ciudad Rodriguez	8 Jan., 1812	11	Taken by assault	16,600	178	818	996	60	291	215
British	Badajoz (2nd)	16 Mar., "	21	Taken by assault	25,800	1,035	3,789	4,824	187	1,569	1,764
British	Almaraz (Forts)	19 May, "	1	Taken by assault	6,000	33	144	177	30	63	608
British & Allies	Salamanca (Forts)	17 June, "	10	Capitulation	4,000	99	331	430	108	146	4,870
" "	Burgos	19 Sept., "	32	Assault repulsed	13,500	509	1,555	2,084	153	731	88
" "	St. Sebastian (1st)	11 July, 1813	14	Assault repulsed	11,600	204	771	975	84	312	146
British	" (2nd)	24 Aug., "	7	Taken by assault	11,000	967	2,478	3,445	313	1,328	1,620
British	Bergen-op-Zoom	8 Mar., 1814	1	Assault repulsed	3,300	174	726	900	272	276	3,200
British & Allies	Sebastopol †	Average..	14 ¹	Aggregate results	164,200	4,407	14,101	18,508	113	6,414	390
		5 Oct., 1854	338	{ British assault repulsed }	50,000	1,616	7,445	8,981	179	2,545	541
French	Saragossa (1st)	30 June, 1808	41	Siege abandoned	15,570	\$	\$	3,500	225	\$	3,000
" "	Ciudad Rodriguez	29 Dec., 1810	54	Capitulation	43,200	\$	\$	3,000	69	\$	31,000
" "	Badajoz	15 June, 1811	24	Capitulation	28,100	182	1,048	1,230	44	\$	5,300
" "	Taragona	28 Jan., 1811	41	Capitulation	17,000	\$	\$	1,600	94	\$	11,800
" "	Tarifa	1 June, "	28	Taken by assault	21,500	\$	\$	4,209	196	\$	42,000
" "	Antwerp	22 Dec., "	24	Assault repulsed	10,400	\$	\$	517	50	\$	13,200
" "		29 Nov., 1832	24	Capitulation	66,500	108	695	903	12	\$	2,500
		Average..	33 ¹	Aggregate results ..	202,270	\$	\$	14,859	73	\$	34,142

† The numbers relating to Sebastopol include the British force only.

§ Numbers not ascertained.

* Include losses from sickness.

TABLE V.—*Showing the Proportion of Deaths to Casualties among Officers only.*

	Killed.	Wounded.	Died of Wounds.	Total Casualties.	Total Deaths.	Proportion of Total Deaths to 1,000 Casualties.
<i>Drinkwater</i> —Siege of Gibraltar	5	35	1	40	6	150·0
<i>Stewart</i> —42nd Regiment	22	97	7	119	29	244·0
79th "	11	69	4	80	15	187·5
92nd "	12	100	13	112	25	223·0
<i>Alcock</i> —Auxiliary Legion	20	197	16	217	36	166·0
<i>Edmonds</i> —Talavera	32	195	13	227	45	198·0
Salamanca	34	188	14	222	48	216·0
Vitoria	25	167	22	192	47	245·0
Orthes	16	134	7	150	23	153·0
Waterloo	143	585	48	728	191	262·5
Crimea (Official Return)	91	241	20	332	111	334·3
Total.....	406	1,973	164	2,379	570	288·9

TABLE VI.—*Returns showing the Proportion of Sick in the British Army in the Peninsula at the undermentioned Dates.*

Date of Return.	Total Strength, including Sick.	Number of Sick.	Proportion Sick of 1,000 Total Strength.
1808.			
October 1	33,129	3,470	105
1809.			
April 22	21,597	2,038	94
May 1	24,227	2,357	97
June 25	26,995	3,246	120
July 1	35,410	4,827	136
September 25	35,018	8,827	253
October 11	33,000	7,800	236
November 14	30,000	9,000	300
1811.			
January 20	39,454	6,715	170
April 25	37,813	9,298	246
July 25	56,933	12,277	216
October 1	57,781	19,088	330
1812.			
January 8	50,994	12,255	240
25	58,664	13,405	229
April 5	46,751	12,016	257
July 25	62,087	17,033	274
1813.			
January 25	65,644	17,513	267
July 25	63,868	12,698	199
1814.			
January 25	67,121	14,144	211
Average	44,500	9,300	209

TABLE VII.—*Returns showing the Proportion of Sick in the French Army in Spain at the undermentioned Dates.*

Date of Return.	Total Strength, including Sick.	Number of Sick.	Proportion Sick of 1,000 Total Strength.
1808.			
October 10	319,690	37,419	117
25	318,934	34,558	108
November 15	335,223	45,107	135
1809.			
October 1	237,330	46,109	194
1810.			
July 15	356,729	47,743	134
August 15	353,918	46,982	133
1811.			
January 15	361,838	48,831	135
April 15	331,776	40,079	121
August 1	372,841	42,433	114
1812.			
January	325,000	42,056	129
April	291,000	34,369	118
May 15	292,000	31,227	107
1813.			
March 15	231,000	30,395	132
July 1	181,000	18,654	103
September 15	173,000	28,241	164
Average	299,000	38,870	130

TABLE VIII.—*Showing the Proportion of Sickness and Mortality among the Troops employed in the Expedition to the Scheldt, in the year 1809.*

Week ending	OFFICERS.			NON-COMMISSIONED OFFICERS AND MEN.		
	Proportion to 1,000 Strength.			Proportion to 1,000 Strength.		
	Of Sick.	Of Weekly Mortality.	Of Equivalent Annual Mortality.	Of Sick.	Of Weekly Mortality.	Of Equivalent Annual Mortality.
10th Sept. 1809	No return	5·20	270	..	388	12·09
17th " "	307	9·15	476	29·79	468	15·92
24th " "	244	3·84	199	15·70	533	17·49
1st Oct. " "	230	2·64	137	11·62	565	15·72
8th " "	186	4·17	217	17·85	587	14·21
24th " "	173	None	..	..	549	9·83
31st " "	135	1·69	88	12·50	530	10·31
14th Nov. " "	81	None	..	..	428	4·51
21st " "	87	Do.	..	..	155	4·54
28th " "	78	Do.	..	..	185	4·79
Average ...	166	3·48	181	8·75	470	12·30
					640	25·38

TABLE IX.—*Abstract of the Returns of Killed and Wounded of the British Army in the Crimea, 20th September, 1854, to 8th September, 1855.*